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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PE-0720	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/BR 03/00199	International filing date (day/month/year) 19.12.2003	Priority date (day/month/year) 14.01.2003
International Patent Classification (IPC) or both national classification and IPC C03C4/00		
Applicant COMPANHIA BRASILEIRA DE METALURGIA... et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 13.04.2004	Date of completion of this report 31.03.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Maurer, R Telephone No. +49 89 2399-8578 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/BR 03/00199**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-6 as originally filed

Claims, Numbers

1-2 as originally filed

Drawings, Sheets

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-2 yes
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-2 no
Industrial applicability (IA)	Yes: Claims	1-2 yes
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BR 03/00199

To point V:

1) Reference is made to the following documents:

D1: DE-C-4309701	D2: US-B1-6333288
D3: WO-A-9219559	D4: WO-A-0009456
D5: US-B1-6184166	D6: EP-A-0594422.

2) Inventive step

2a) Closest prior art document is D1 (page 2, line 1-6; page 3, line 24-26; claim 1) discloses a lead-free crystal glass composition exhibiting

- a density greater than $2,45 \text{ g/cm}^3$ and
- a refractory index n_d of greater than 1,52

with the following composition

		(present application)
SiO ₂	50-75 wt%	50-75
Na ₂ O	2-15 wt%	5-10
K ₂ O	1-15 wt%	5-15
CaO	3-12 wt%	3-12
BaO	1 -10 wt%	0,1-5
Nb ₂ O ₅	0,1- 5 wt%	0,1- 10,

from which the glass according to the present application that Nb₂O₅ is up to 10 wt%.

The positive effect of Nb₂O₅ (in a range of e.g. 6-12 wt%) on the desired optical position, in particular low Abbe numbers and at the same time a high refractive index in lead-free crystal glass of the type SiO₂-Na₂O-K₂O-B₂O₃-CaO-BaO-TiO₂ is known from D2 (column 3, line 7-19; claims 1-10).

The person skilled in the art whose aim is to achieve a lead-free crystal glass with improved refraction index ($>1,51$) would start from the lead-free crystall glass disclosed in D1 and for improving the desired optical properties take into consideration D2 and find out by simple testing the most appropriate glass composition.

Accordingly, claims 1 and 2 of the present application do not fulfil the requirements of Article 33(3) PCT.